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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/021,039

12/19/2001

Masao Kitagawa

60188-132

9505

7590

03/21/2006

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EXAMINER

TUCKER, WESLEY J

ART UNIT

PAPER NUMBER

2623

DATE MAILED: 03/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/021,039	KITAGAWA, MASAO	
	Examiner	Art Unit	
	Wes Tucker	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13 and 15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13 and 15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 6th 2006 has been entered.

Response to Arguments

Applicants response filed March 6th 2006 has been entered and made of record.

Applicant has amended claim 13. Claims 1-12, 14 and 16-18 were previously canceled. Claims 13 and 15 remain pending.

Applicants remarks have been fully considered but are not found persuasive for at least the following reasons:

Applicants arguments are primarily directed to the feature of:

"a difference calculating section shared for calculating the difference between pixel data for reducing the random noise by the random noise reducing section and for calculating the difference between pixel data for obtaining the degree of motion of the image by the motion detecting section."

Examiner presents again the discussion presented in the Advisory Office Action filed February 7th 2006:

Examiner points to the passage in Hossack found at column 11, lines 1-55 with particular emphasis on lines 45-55. Hossack discloses a function d for determining the sum of differences between the present image frame and the previous image frame. In this way motion is detected using the difference values. Using the same d function it can also be determined when the difference is attributed to noise (column 11, lines 45-55). Therefore, the difference calculation embodied in the function d (column 11, lines 7-11) is interpreted on a difference calculation section shared for calculating differences to be used in motion detection and random noise reduction.

The previously presented rejection is accordingly maintained.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,178,205 to Cheung et al. and U.S. Patent 6,083,168 to Hossack et al.

With regard to claim 15, Cheung discloses a noise reducing apparatus comprising:

at least one noise reducing section for reducing encoding noise of image data with controllable noise reduction characteristics (column 3, lines 40-45);

a control section for controlling the noise reduction characteristics of the noise reducing section according to at least one of a scale factor for scaling an image represented by the image data and a degree of motion of the image (column 3, lines 45-50).

Cheung does not disclose removing noise according to scale but he does disclose a noise removal device that takes into account motion vectors (column 3, lines 40-50). The control section is considered to be part of the processor that performs filtering according to the motion detected.

Cheung discloses the noise reducing apparatus further comprising a motion detecting section for obtaining the degree of motion of the image and wherein the control section controls the noise reduction characteristics of the noise reducing section according to output of the motion detecting section (column 3, lines 40-50 and column 5, lines 45-50). Cheung discloses determining the difference between pixels values in two different images or pixel sets and based on those differences motion vectors are determined giving a degree of motion and a corresponding filtering function.

Cheung does not explicitly disclose wherein the motion of the image is obtained based on values of differences between pixel data of pixels of the same position in at

least one pair of successive field images or frame images, the difference being obtained for pixels in at least a part of each field image or each frame image.

Hossack discloses determining motions estimates using sums of absolute differences between pixels at the same location in successive frames (column 10, lines 49-55). Hossack further teaches that an advantage of using a minimum sum of absolute differences to determine a measure of image motion gives an error signal related to noise in the image (column 10, lines 62-64). Therefore it would have been obvious to one of ordinary skill in the art to use a sum of the absolute difference between images in order to determine a degree of motion and to obtain an error signal related to noise in the image.

Hossack further discloses wherein the motion detecting section obtains the degree of motion of the obtained for image based on a plurality of sums respectively of image pairs a plurality of sums respectively (column 10, lines 49-55 and column 11, lines 1-10). Hossack discloses where successive frames are used to calculate the differences between the previous frame $O(n-1)$ and the current frame $I(n)$. This clearly suggests that a plurality of differences are determined for a plurality of successive frames. This clearly reads on the claimed limitation where "the motion detecting section obtains the degree of motion of the image based on a plurality of sums respectively obtained for a plurality of image pairs."

Hossack further teaches a random noise reducing section for reducing random noise of the image data, based on a difference between pixel data of pixels of the same position in at least one pair of successive field images or frame images (column 11,

lines 46-55). Hossack teaches that the calculation of the difference value can be used in order to determine how to reduce noise and improve the signal to noise ratio of the image thereby creating a better quality image for viewing. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to use reduce noise using the difference value taught by Hossack in order to enhance the quality of the image.

Hossack further teaches that the difference calculating section be shared for calculating noise and for calculating motion. Hossack discloses a difference calculating section shared for calculating the difference between pixel data for reducing the random noise by the random noise reducing section and for calculating the difference between pixel data for obtaining the degree of motion of the image by the motion detecting section (column 10, lines 62-67 and column 11, lines 1-10 and lines 46-55). Here it is clearly shown that the sum of differences or difference value is used as both a determination of motion as well as an error signal related to noise.

Hossack discloses a function d for determining the sum of differences between the present image frame and the previous image frame. In this way motion is detected using the difference values. Using the same d function it can also be determined when the difference is attributed to noise (column 11, lines 45-55). Therefore, the difference calculation embodied in the function d (column 11, lines 7-11) is interpreted on a difference calculation section shared for calculating differences to be used in motion detection and random noise reduction.

Hossack also teaches that an advantage of this implementation is that the sum of absolute differences is an error signal related to noise in the image (column 10, lines

62-65). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to use the difference value calculated by Hossack as representing both a noise value and a degree of motion in order to share a difference calculating section.

Cheung discloses removing coding artifacts or noise according to motion and Hossack discloses the precise motion detection as claimed. Therefore it would have been obvious to one of ordinary skill in the art to use the motion detection of Hossack with the noise removal of Cheung.

With regard to claim 13, Cheung and Hossack disclose the noise reducing apparatus according to claim 12. Hossack further discloses wherein the motion detecting section obtains the degree of motion of the image based on a comparison result of each of the sums with at least one prescribed threshold value (column 10, lines 62-67 and column 11, lines 1-20). Hossack discloses determining a degree of motion from a sum of absolute differences compared with a threshold. Since it is an ongoing process in video the comparison is made with each of the sums.

Conclusion

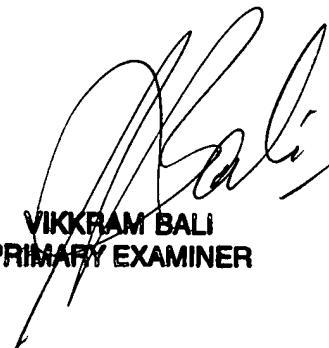
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wes Tucker whose telephone number is 571-272-7427. The examiner can normally be reached on 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on 571-272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wes Tucker

3-9-06



VIKKRAM BALI
PRIMARY EXAMINER